Switchover to *p*+AI

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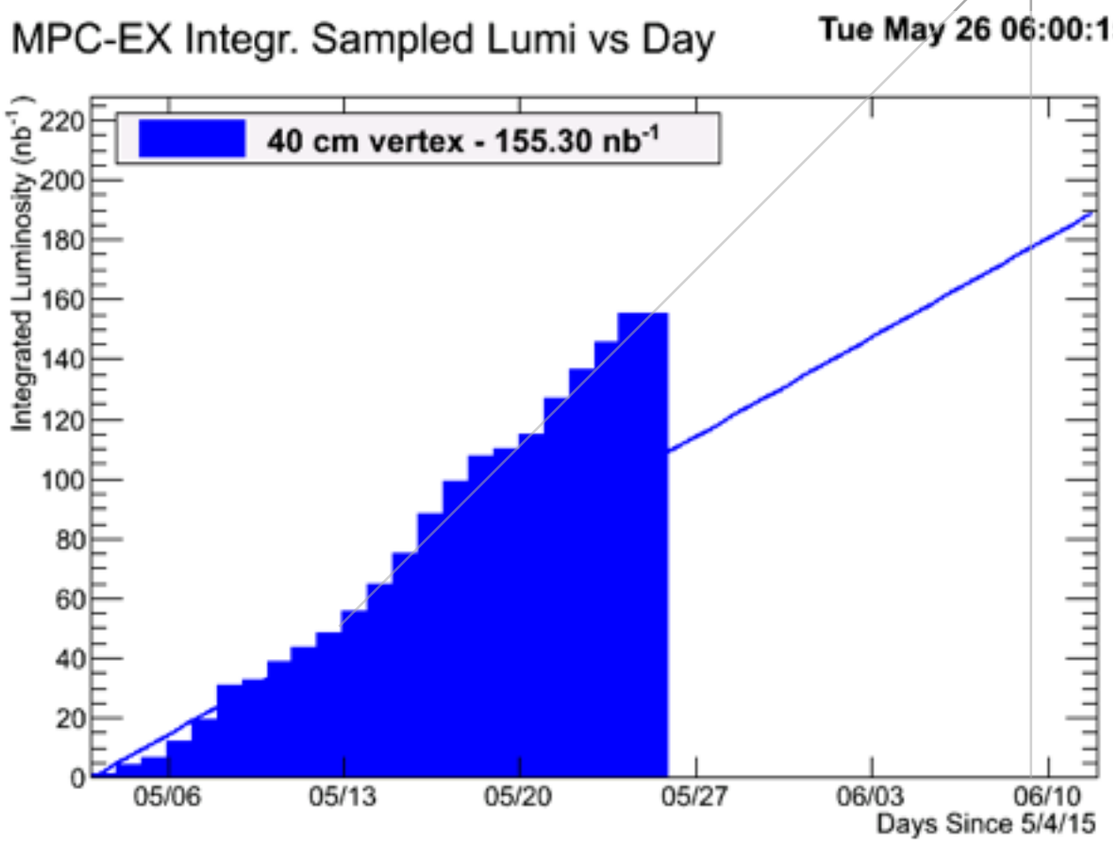
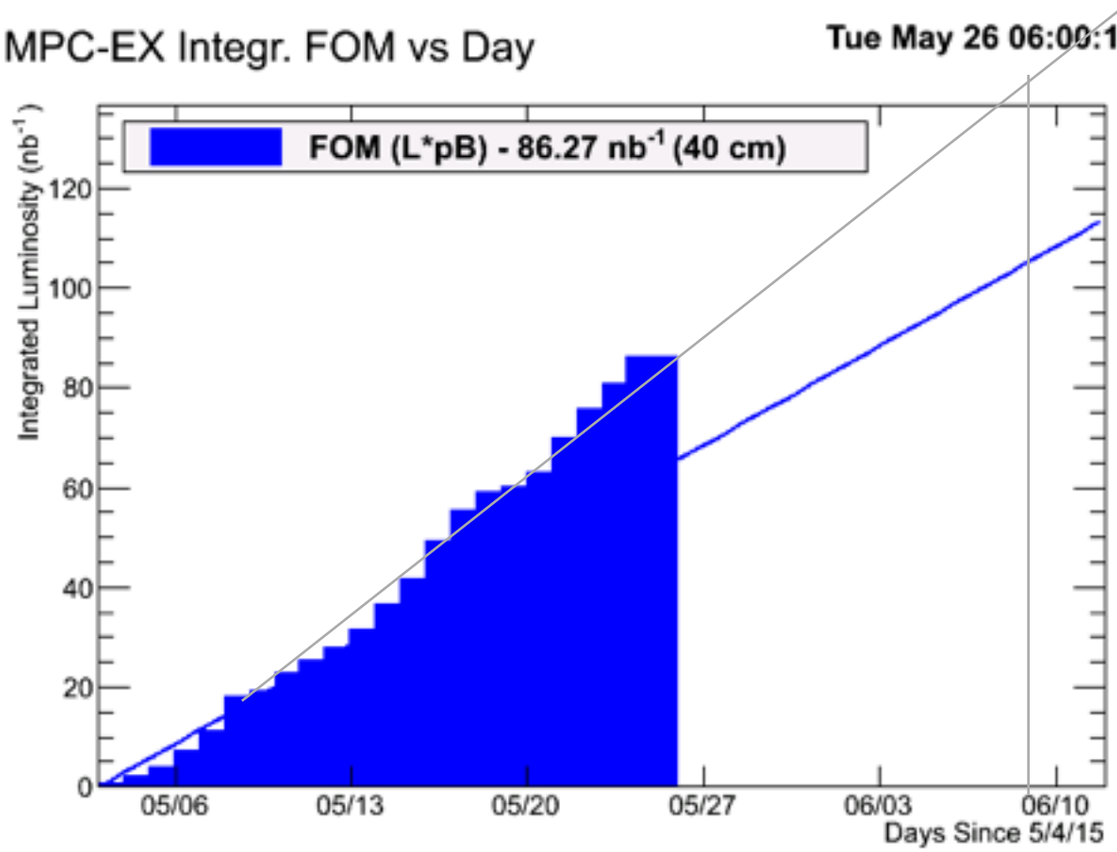
Achieving p+Au goals





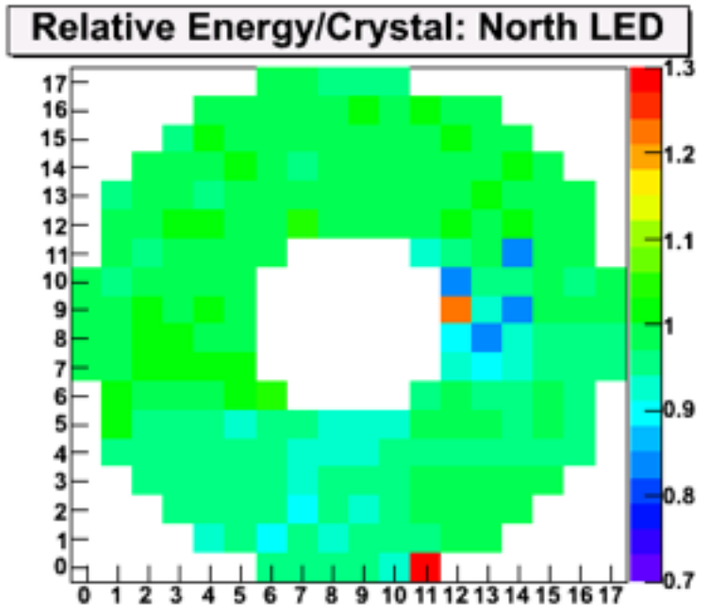
RHIC running steadily and PHENIX high efficiency (~77%)

Balancing p+Au and p+Al goals

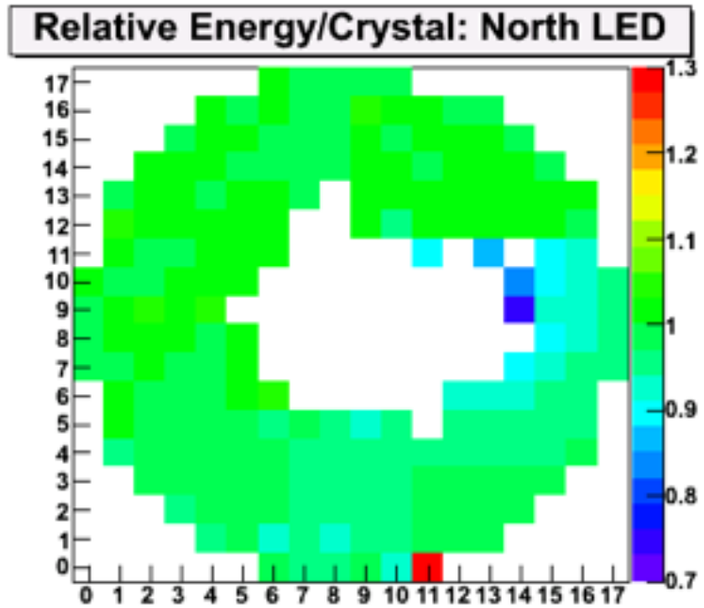
BUP goal of 190/nb for |z| < 40cm at 60% polarization. Integrated luminosity plot extrapolates to about 280/nb by June 8. The figure of merit extrapolates to about 140/nb compared to a goal of 114/nb (at 5.7/nb per day). We're on track to be 15-20% above our BUP goal for the FOM. The June 8 switchover fits the goals of providing a good p+Au data set, even with the loss of acceptance due to the abort kicker pre-fire, while also preserving time for a good p+Al run.

Lose 21 (of 220) MPC towers on the north (low-x) direction due to abort kicker pre-fire damage $\Longrightarrow$ 5% geometric loss, but with increased edge effects more like 10%. For pi0's this usually goes like the square, so it's probably about a 20% loss for the pi0's where the two gammas are well separated, which is up to energies for ~20–24 GeV.

MPC tower response



before



after

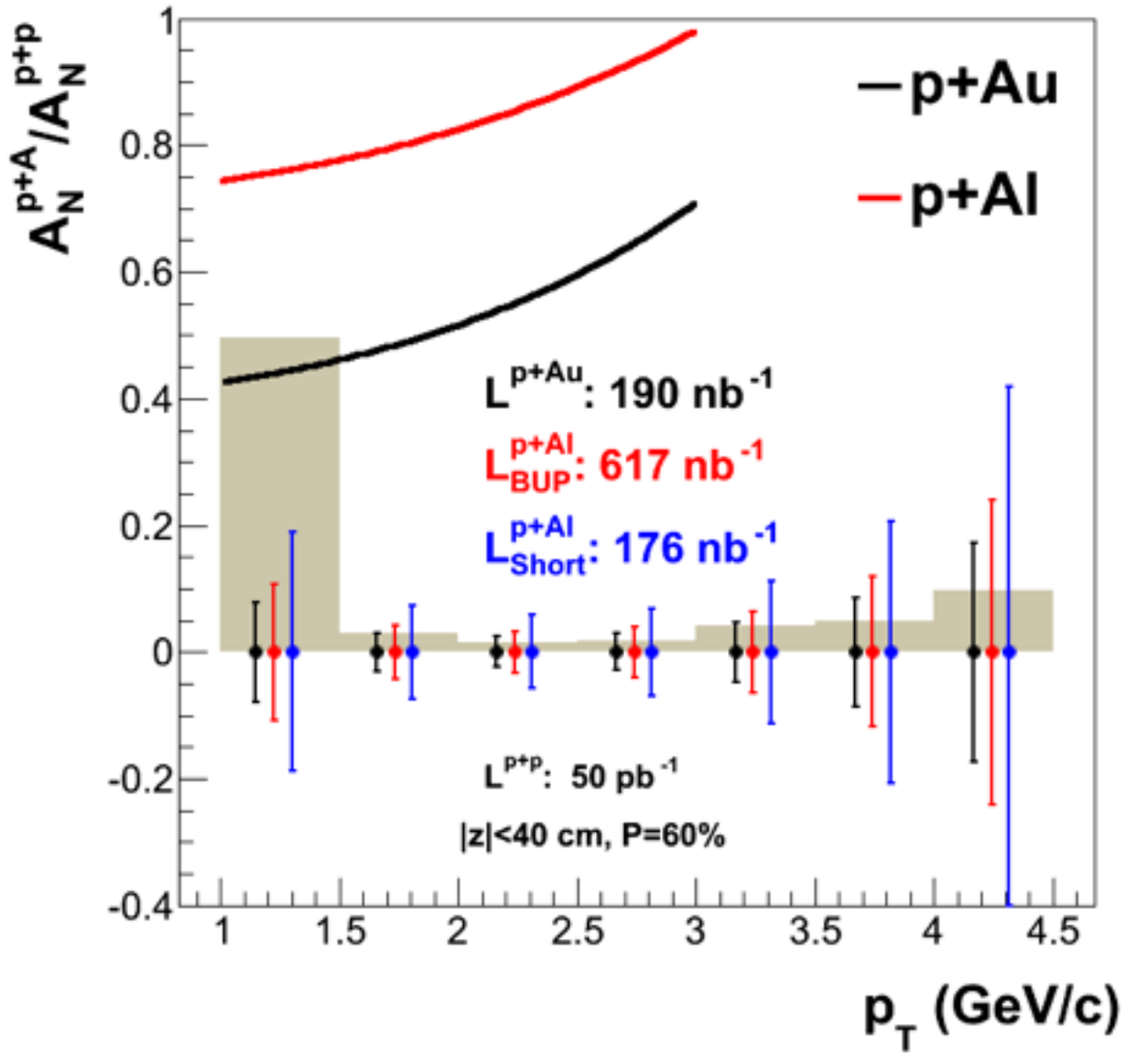
Luminosity projections

PHENIX typically assumes a 70% data taking efficiency, 70% vertex cut (for a vertex cut of 40cm) and a 90% DAQ livetime in going from C-AD delivered to PHENIX sampled luminosity.

Using the Sept 2014 projections from Wolfram for p+Al (central values) and after some confirming discussions with STAR:

1-week: 400/nb × 0.7 × 0.7 × 0.9 = 176/nb
2-week: 1400/nb × 0.7 × 0.7 × 0.9 = 617/nb

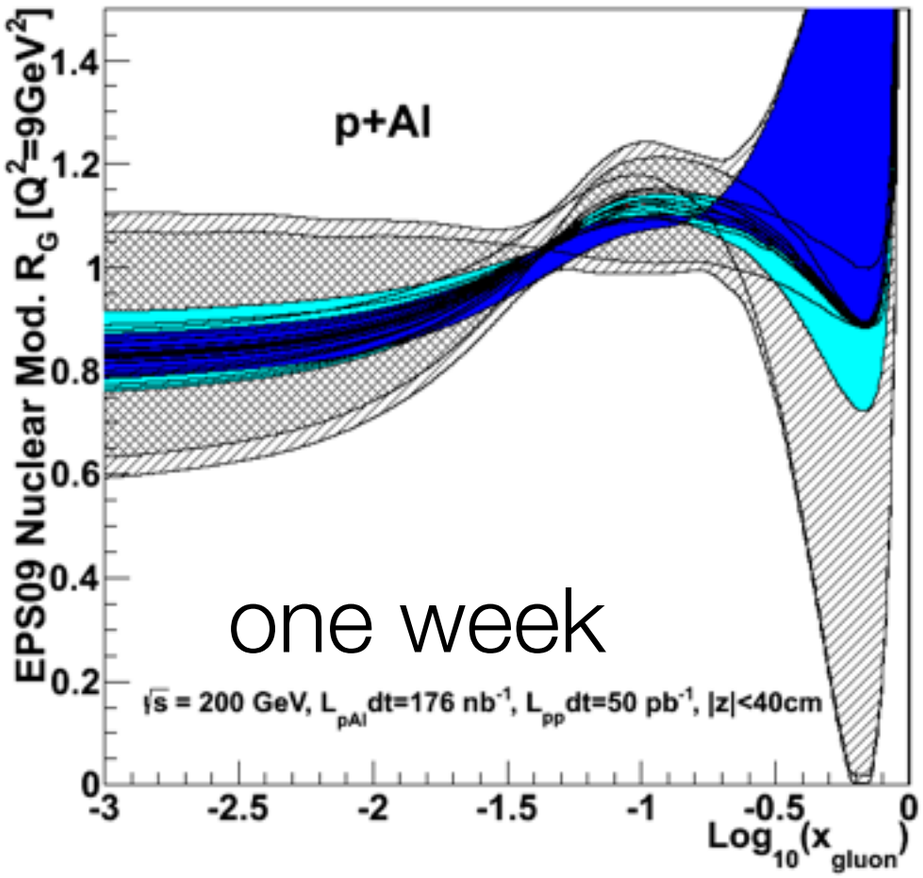
Saturation physics

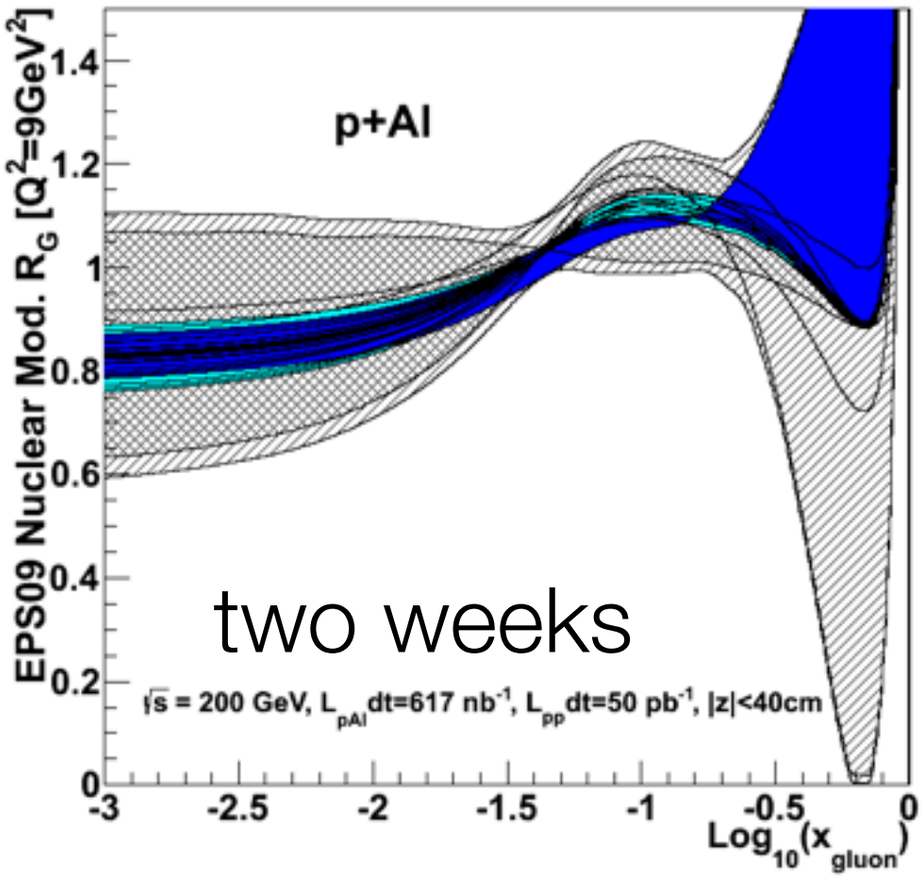


1-week: 400/nb × 0.7 × 0.7 × 0.9 = 176/nb

2-week: 1400/nb × 0.7 × 0.7 × 0.9 = 617/nb

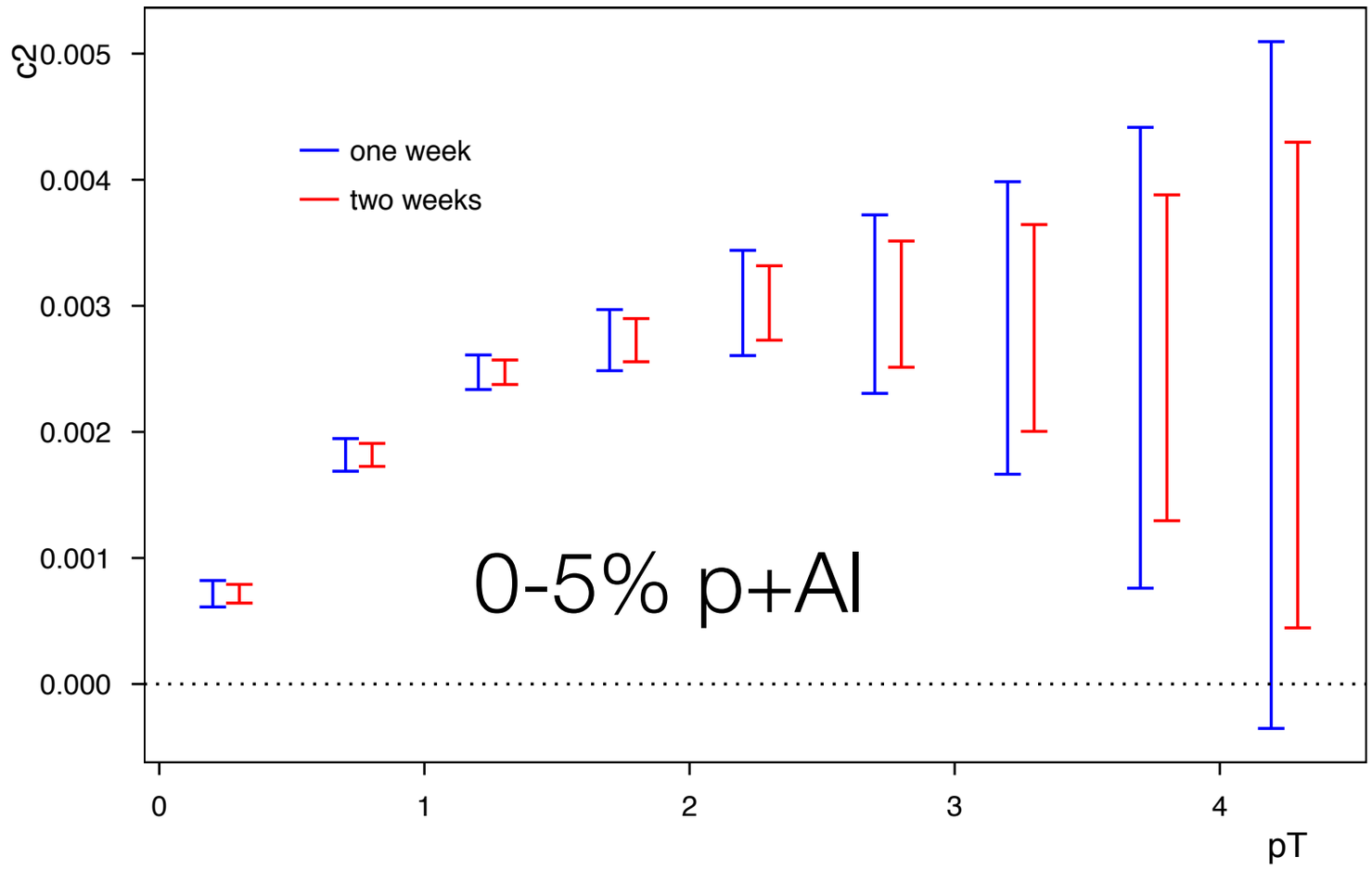
Gluon nuclear PDF





1-week: 400/nb × 0.7 × 0.7 × 0.9 = 176/nb
2-week: 1400/nb × 0.7 × 0.7 × 0.9 = 617/nb

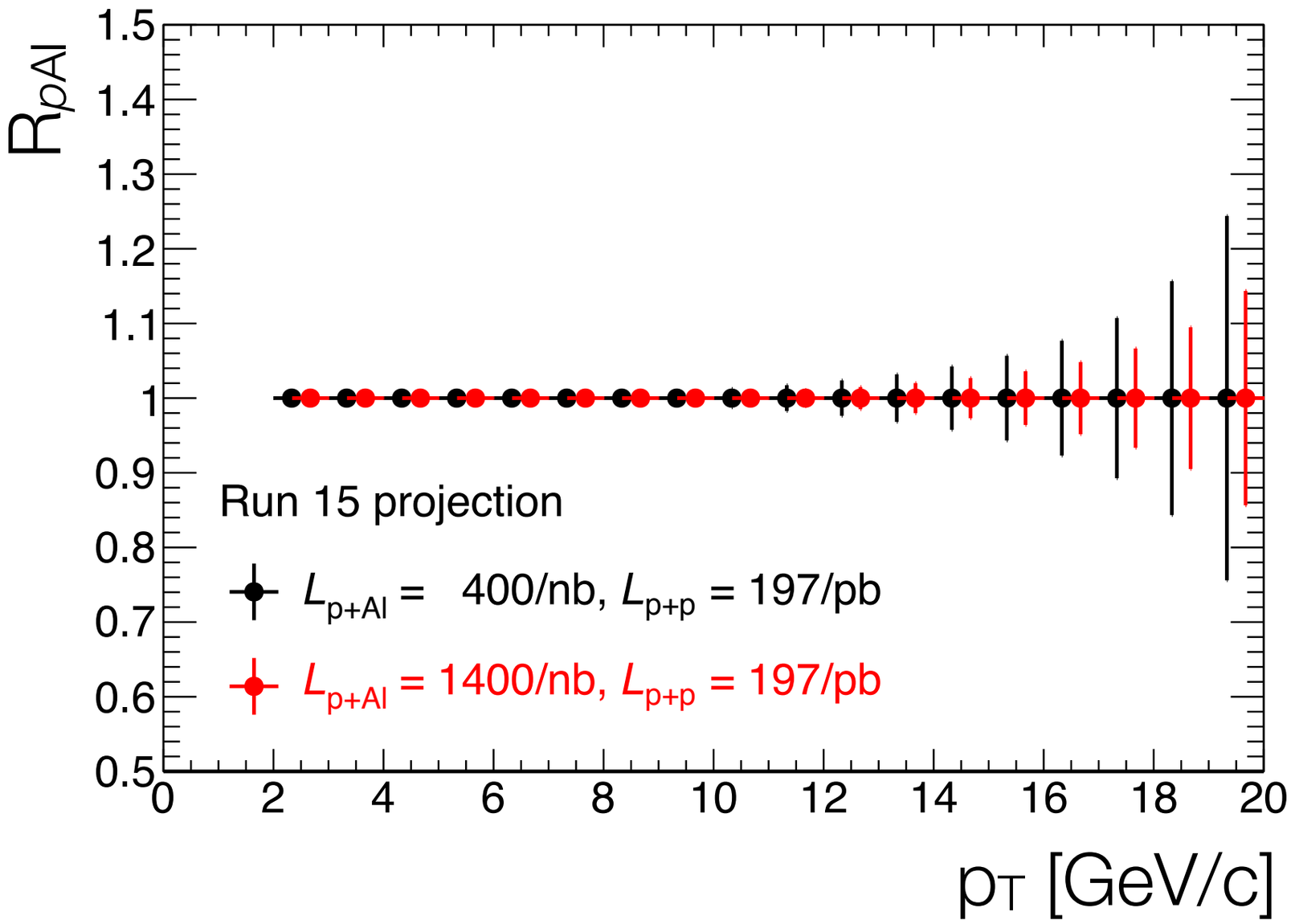
Measuring azimuthal anisotropy (c_2) in *p*+Al



1 kHz of DAQ bandwidth for one (two) weeks yields about 14M (28M) events in top 5% centrality.

The c_2 input shown is from 20-40% *d*+Au – similar N_{part} as 0-5% *p*+Al

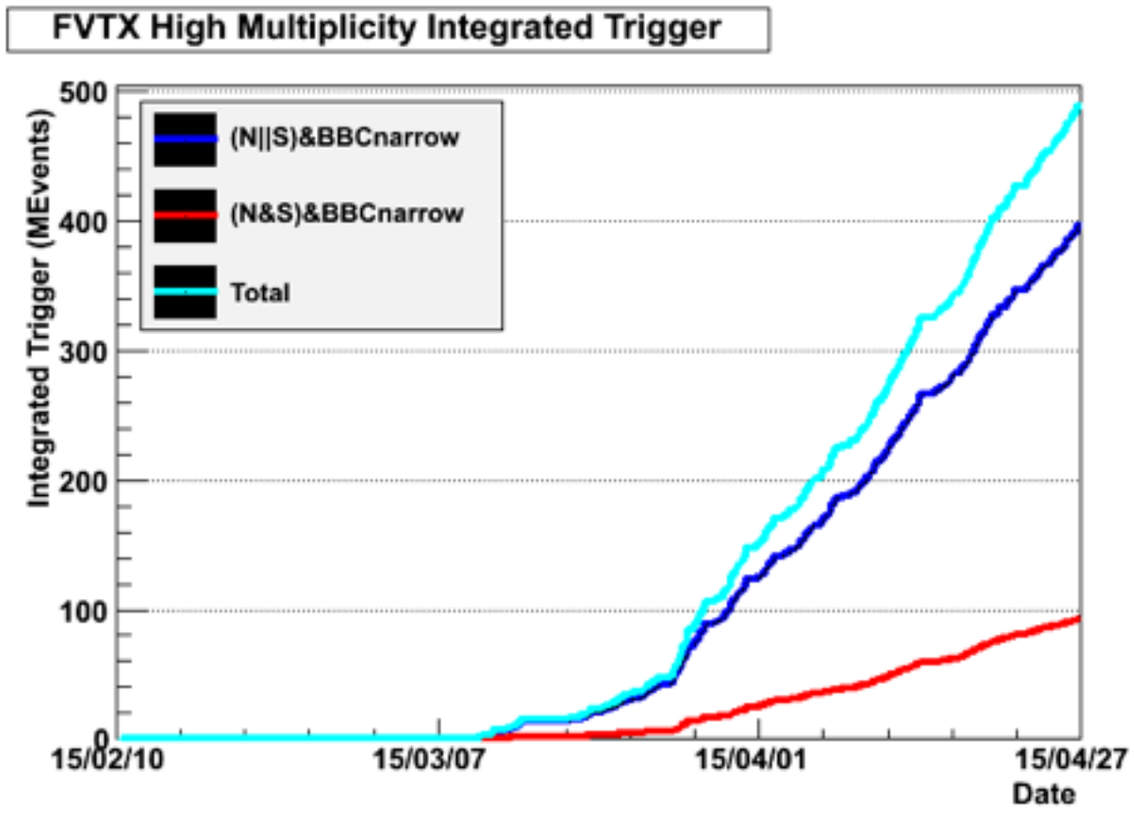
Projected π^0 R_{pAl}

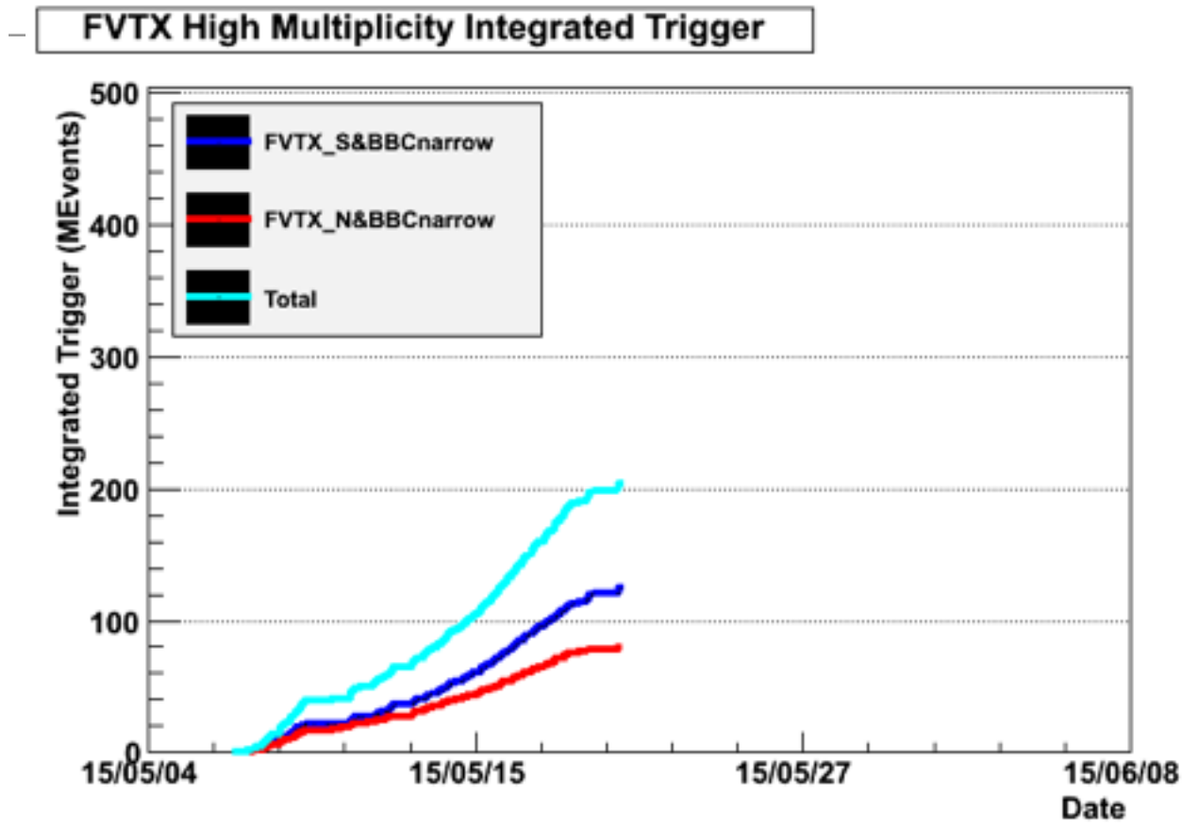


C-AD actual Run-8 *delivered* luminosity and projected Run-15 delivered luminosity used to scale Run-8 *d*+Au (60-88%) statistics.

$\langle N_{coll}^{d+Au\ (60\text{-}88\%)} \rangle = 3.2 \sim \langle N_{coll}^{p+Al} \rangle = 2.3$

FVTX high-multiplicity trigger (ridge in p+Al)





	pp 200GeV	Au-going (pAl)	Al-going (pAl) 1 week	Al-going (pAl) 2 week
# Trigger	500M	300M	100M	200M
Purity	0.10	0.8	0.34	0.34
# of High Mult Event	50M	240M	34M	68M

Summary

- on track for 15-20% above BUP goals for *p*+Au FOM – loss of MPC-N acceptance *roughly* compensated

- *p*+Al projections: 176/nb for one week, 617/nb for two weeks

- key observables include A_N ratio, gluon nPDF, c_2, π^0 R_{pAl}, high multiplicity FVTX trigger

- particularly for A_N ratio and c_2, two weeks of p+Al is better

- no reason to alter June 8 switch over to p+Al